

HALL ET AL
Serial No. 10/694,827
Filed 10/29/2003
Examiner: Johnson
Group Art Unit 1754

Amendments to the Claims:

This listing of claims replaces all prior versions and listings of claims in the application:

Listing of Claims:

Claims 1-10. (Cancelled)

11. (Previously Presented) A method of treating a gaseous medium including nitrogenous oxides to remove the nitrogenous oxides therefrom, which method comprises the operations of activating a gaseous hydrocarbon for achieving partial oxidation by generating an electric discharge in the gaseous hydrocarbon in the presence of a gas permeable first material which has oxidative properties in the presence of a non-thermal plasma and contacting a combination of the activated hydrocarbon and gaseous medium with a second material adapted in the presence of the activated hydrocarbon to catalyze the reduction of the nitrogenous oxides in the gaseous medium to nitrogen, wherein the second material is a mixture of equal parts by weight of anatase phase titania and zirconia.

Claims 12-20. (Cancelled)

21. (Previously Presented) A reactor system for the plasma assisted treatment of a gaseous medium to remove nitrogenous oxides therefrom, which system comprises a gas permeable body including a first material adapted in the presence of a non-thermal plasma to activate, for partially oxidizing, a gaseous hydrocarbon passing therethrough, a gas permeable body including a second material adapted in the presence of an activated hydrocarbon for catalyzing the reduction to nitrogen of nitrogenous oxides contained in the gaseous medium and means for applying to the first material a potential sufficient to excite an electric discharge in a

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gaseous hydrocarbon passing through the said body including the first material; a source of a gaseous hydrocarbon, a first reactor to which the source of hydrocarbon is connected, said first reactor containing a gas permeable bed of the first material and means for establishing an electric discharge in the gaseous hydrocarbon in the interstices in the bed of the first material, a second reactor including a gas permeable bed of the second material and means for combining plasma activated hydrocarbon from said first reactor with the gaseous medium from which nitrogenous oxides are to be removed prior to the combination passing into the said second reactor; wherein there is included a further reactor through which the gaseous medium from which nitrogenous oxides are to be removed is passed prior to the combination of the plasma activated hydrocarbons therewith, said further reactor also including a gas permeable bed of the first material and means for establishing an electrical discharge in the gaseous medium in the interstices of the bed of first material in said further reactor thereby to effect the oxidation of particulate carbonaceous material in the gaseous medium.

Claims 22-26. (Cancelled)

27. (Previously Presented) A reactor system for the plasma assisted treatment of a gaseous medium to remove nitrogenous oxides therefrom, which system comprises a gas permeable body including a first material adapted in the presence of a non-thermal plasma to activate, for partially oxidizing a gaseous hydrocarbon passing therethrough, a gas permeable body including a second material adapted in the presence of an activated hydrocarbon for catalyzing the reduction to nitrogen of nitrogenous oxides contained in the gaseous medium and means for applying to the first material a potential sufficient to excite an electric discharge in a

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gaseous hydrocarbon passing through the said body including the first material; wherein the second material is a mixture of equal parts by volume of anatase phase titania and zirconia.

28. (Previously Presented) A reactor system for the plasma assisted treatment of a gaseous medium for removing nitrogenous oxides therefrom, which system comprises a gas permeable body including a first material adapted in the presence of a non-thermal plasma to activate oxidatively a gaseous hydrocarbon passing therethrough, a gas permeable body including a second material adapted in the presence of an oxidatively activated hydrocarbon to catalyze the reduction to nitrogen of nitrogenous oxides contained in the gaseous medium and means for applying to the first material a potential sufficient to excite an electric discharge in a gaseous hydrocarbon passing through the said body including the first material; wherein there is provided a source of a gaseous hydrocarbon, a first reactor to which the source of hydrocarbon is connected, said first reactor containing a gas permeable bed of the first material and means for establishing an electric discharge in the gaseous hydrocarbon in the interstices in the bed of the first material, a second reactor including a gas permeable bed of the second material and means for combining plasma activated hydrocarbon from said first reactor with the gaseous medium from which nitrogenous oxides are to be removed prior to the combination passing into the said second reactor; wherein there is included a further reactor through which the gaseous medium from which nitrogenous oxides are to be removed is passed prior to the combination of the plasma activated hydrocarbons therewith, said further reactor also including a gas permeable bed of the first material and means for establishing an electrical discharge in the gaseous medium in the interstices of the bed of

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first material in said further reactor thereby to effect the
oxidation of particulate carbonaceous material in the gaseous
medium.